Remarks

In view of the above amendments and the following remarks, reconsideration of the rejection and further examination are requested.

Claims 9-17, 22, 28 and 33 and 36 have been allowed. The Applicants would like to thank the Examiner for this indication of allowable subject matter.

Claims 32, 34 and 35 have been rejected under 35 U.S.C. §102(b) as being anticipated by Brauers (US 6,021,173).

Claims 32, 34 and 35 have been amended so as to further distinguish the present invention, as recited therein, from the reference relied upon in the rejection. Support for the claim amendments can be found at least at page 13, lines 17-25 and page 19, lines 19-24 of the original specification.

It is submitted that claims 32, 34 and 35 are patentable over the reference relied upon in the rejection for the following reasons.

Claim 32 is patentable over Brauers, since claim 32 recites a p-type semiconductor comprising a plurality of elements, one of the elements being a localized band formation element, the localized band formation element being isovalent with at least one other of the elements of the p-type semiconductor and having a smaller electronegativity than an electronegativity of the at least one other element, wherein the p-type semiconductor is a group II-VI oxide semiconductor.

The present invention as recited in claim 32 forms a p-type semiconductor that has a high concentration of hole carriers by forming an acceptor level lower than a top of a localized band through a dopant of a localized band formation element to a group II-VI oxide semiconductor to activate holes of the acceptor level. Here, the localized band formation element is isovalent with at least one other element of the p-type semiconductor, and has a smaller electronegativity than an electronegativity of the at least one other element.

On the other hand, Brauers only discloses a semiconductor obtained by doping Se, S, Te, or As to a lead-oxide layer semiconductor. In other words, Brauers relates to a lead-oxide layer semiconductor and is clearly different from the group II-VI oxide semiconductor recited in the amended claim 32. Furthermore, Brauers fails to disclose forming a p-type semiconductor that has a high concentration of hole carriers obtained by activating holes of an acceptor level. Thus, Brauers cannot realize a p-type semiconductor with a high concentration of hole carriers

obtained by activating holes of an acceptor level, in contrast to a group II-VI oxide semiconductor.

Further, in the lead-oxide PbOx disclosed in Brauers, x ranges from 1 to 2. Generally speaking, a lead-oxide contains lead and oxygen in a 1:1 ratio. At column 3, lines 25-30, Brauers states that "[t]he non-stoichiometric lead-oxide semiconductor cladding layer containing a relative excess of oxygen has a substantial lateral electric conductivity for holes. The non-stoichiometric lead-oxide semiconductor cladding layer containing a relative deficiency of oxygen has a substantial lateral electric conductivity for electrons." Based on a study by the Applicant, PbO has a forbidden bandwidth of only 1.9 eV that is approximately the same as the electron volts of the forbidden bandwidth of GaP or the like. Thus, holes can be easily produced even with a deficiency of lead because the forbidden bandwidth is relatively narrow. In other words, PbO is a material sufficient to achieve the conductivity of holes without forming a localized band obtained by introducing an element belonging to an oxygen group as described in the present invention. Thus, a person of ordinary skill in the art would not have been motivated to modify Brauers for realizing a p-type semiconductor with a high concentration of hole carriers obtained by forming a localized band.

Additionally, in Brauers, Se, S, and Te are introduced so that "the spatial resolution of the sensor matrix is so low that the smallest detectable detail in the x-ray-image has a size larger than about half the distance between the partitions of the scatter grid." (See column 3, lines 41-44). This technique does not relate to the formation of a localized band with the element belonging to an oxygen group as disclosed by the present invention. Thus, a person of ordinary skill in the art also would not have been motivated to modify Brauers for realizing a p-type semiconductor with a high concentration of hole carriers obtained by forming a localized band for this reason.

As for claims 34 and 35, they are patentable over Brauers for reasons similar to those discussed above in support of claim 32.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

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